Exemption No. 6752

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of

Douglas Aircraft Company **Regulatory Docket No. 28881**
McDonnell Douglas Corporation

for an exemption from 14 CFR §§ 25.785(d),
25.807(c)(1), 25.857(e),
and 25.1447(c)(1)

PARTIAL GRANT OF EXEMPTION

By letter dated April 18, 1997, Mr. Dave Almodovar, Product Support Airworthiness, Douglas Aircraft Company, McDonnell Douglas Corporation, 3855 Lakewood Blvd., Long Beach, CA 90846-0001, petitioned for exemption from the requirements of 14 CFR §§ 25.785(d), 25.807(c)(1), 25.857(e), and 25.1447(c)(1) for the accommodation of up to four supernumeraries immediately aft of the cockpit on DC-10 freighter aircraft equipped with a Class E cargo compartment.

Sections of the FAR affected:

Section 25.785(d), as amended by Amendment 25-20, requires, in pertinent part, that there be a firm handhold to enable occupants to steady themselves while using the aisles in moderately rough air.

Section 25.807(c)(1), as amended by Amendment 25-15, requires, in pertinent part, that a minimum of one Type IV emergency exit be installed in each side of the fuselage for passenger seating configurations of one through ten.

Section 25.857(e), as adopted in part 25, defines the attributes of a Class E cargo compartment, and requires that a Class E cargo compartment may not be on any aircraft other than one utilized exclusively for the carriage of cargo (i.e., occupants other than flightcrew not permitted).

Section 25.1447(c)(1), as adopted in part 25, requires, in pertinent part, that oxygen masks must be immediately available to each seated occupant, be automatically deployed, and must exceed in number the quantity of seats by a minimum of ten percent, with the extra units distributed evenly throughout the cabin.

Related Sections of the FAR:

14 CFR § 121.583(a) contains, in pertinent part, a listing of categories of the occupants who may be carried aboard an airplane in part 121 service without complying with all the passenger-carrying airplane requirements of part 121.

The petitioner's supportive information is as follows:

Pursuant to 14 CFR 11.25, Douglas Aircraft Company (DAC), manufacturer of McDonnell Douglas Corporation (MDC) DC-10 model aircraft, hereby petitions for exemption from the requirements of §§ 25.785(d), 25.807(c)(1), 25.857(e), and 25.1447(c)(1) for MDC model DC-10 freighter airplanes operating with the following Class E cargo compartment configurations:

"To allow carriage of up to four supernumeraries in a courier area aft of the cockpit door and forward of a rigid cargo barrier, or,

"To allow carriage of up to two supernumeraries in a courier module area aft of the cockpit door and forward of the 9g crash net.

"The exemption for the total number of supernumeraries, would apply depending on which of the above two configurations will be utilized."

"Nature of extent of relief sought:"

The main purpose of this request for exemption is to permit carriage of supernumeraries on a freighter airplane with a Class E cargo compartment. Sections from which exemption is sought to varying degrees are:

"Section 25.785(d): No hand hold is installed.

"Section 25.807(c)(1): Relief is sought to show that an equivalent or greater level of safety is provided by the two oversized Type I exits provided in the forward portion of the main deck of the DC-10 freighter airplane."

Section 25.857(e): Relief is sought to permit the accommodation of up to four supernumeraries during taxi, takeoff, flight, and landing, in an airplane with a Class E cargo compartment.

"Section 25.1447(c)(1): One oxygen dispensing unit is supplied and readily available for every seated occupant in the courier seats. The occupants will take hold of the mask upon instruction via lighted signs and chimes. These signs and chimes are either automatically activated by an altitude sensing aneroid switch or can be activated manually by the cockpit crew."

"Information provided in support of petition:"

The MDC DC-10-10F/-30F/-40F is a pressurized, transport category airplane powered by three turbofan engines. It is included on Type Certificate Data Sheet (TCDS) No. A22WE, which was issued for the first DC-10 freighter aircraft on March 30, 1973. The airplanes that would be affected by this exemption have the main deck configured as a Class E cargo compartment.

In order to optimize cargo missions, a courier area accommodating four supernumeraries, or a courier module accommodating two supernumeraries, is provided between the flight deck and the main deck Class E compartment, in the direct vicinity of the exits. "Except for the sections from which exemption is requested, all design criteria applicable to the carriage of passengers have been taken into account during the design of these accommodations. In particular, protection from crash injury and from the penetration of smoke and noxious gases is provided by the rigid cargo barrier with a smoke-tight curtain, and the 9g crash net configuration with the smoke curtain, which isolates the main deck cargo compartment from the zone where the supernumeraries are seated. Two emergency exits are provided, one on each side of the fuselage, each equipped with slide/rafts." Supplemental oxygen for the supernumeraries is supplied from the same distribution system which provides supplemental oxygen to the flight deck. There are two 115 cu. ft. supply cylinders located beneath the cockpit floor. There are no means to separate the supernumeraries' oxygen supply from that of the flight deck crewmembers. "If a shut-off valve is installed, it is only for use by maintenance personnel to isolate a leak. The supernumeraries are notified that oxygen masks need to be used by a continuous chime and lighted signs located in their direct eye scan. A press-to-test and reset button for the 'Don Oxygen' light will be installed." "These warning features (chime and lighted signs) can be either manually activated by the flight crew members or automatically turned on by an altitude pressure switch. The masks are of the quick-donning, full-face type similar to the cockpit masks.

"Two-way communication with the cockpit is possible through dedicated communication panels, and other emergency equipment required by the applicable airworthiness standards is

also provided. Douglas Aircraft Company believes that an equivalent level of safety with the requirements from which relief is sought will be achieved by design precautions and by the introduction of instructions in the DC-10 TCDS, defining the conditions under which supernumeraries may be carried (Ref. § 121.583(a)).

"Supporting arguments:"

1. Cargo operators need support personnel for the safe handling of cargo in the process of loading and unloading. "Such personnel are obviously needed both at departure and arrival of a cargo flight. It is particularly important that the cargo handlers are present upon airplane arrival if perishable goods or live animals are carried. The most efficient, surest, and most cost-effective way to assure their attendance at destination airports is to transport them aboard the cargo flight.

"2. Among their various missions, cargo operators may have to carry goods such as live animals, hazardous materials, and valuable or perishable cargo. Such types of cargo cannot be left unattended, even for the duration of a flight, and the presence of personnel qualified in their handling is necessary on the airplane on which they are carried. The rigid cargo barrier is designed with a sliding door and a viewing window on the right hand side looking aft, (reference figure 3)[available in the docket] to allow crew members to have access to the cargo compartment. Safety and efficiency of the operation will therefore be enhanced.

"3. Cargo operators also need to have qualified personnel necessary for operation and maintenance purposes at various locations. They will optimize their missions if they are permitted to carry personnel aboard their cargo flights, thus saving travel by regular passenger flights.

"4. The airworthiness standards applicable to the Type Certificate of the DC-10/-10F/-30F/-40F, as well as the current airworthiness standards, address the accommodation, aboard commercial flights, of only the following two types of occupants:

"Crewmembers, including flightcrew members and cabin attendants, who are each assigned duties associated with the operation of the airplane, and;

"Passengers, who have no expected ability in the use of emergency provisions, and therefore need to be attended.

"The categories of occupants for which this exemption is sought are qualified aeronautical personnel. Furthermore, they are briefed in the autonomous use of emergency equipment and emergency exit operation. It will also be required that the operator allow access to these seats only to persons found able to perform these tasks on their own."

Non-compliance with the requirements of § 25.1447(c)(1) for oxygen dispensing units to be automatically presented before cabin pressure altitude exceeds 15,000 ft. is compensated for by the users having knowledge of equipment location and use. "The masks provided are quick-donning masks with regulator, and are immediately available to seated occupants in a similar manner as for flight crew members. As to the requirement of § 25.1447(c)(1) for a ten-percent excess quantity of dispensing units, this is mainly required for two purposes: by cabin attendants moving along the aisles, and to accommodate infants held in laps. None of these factors applies to the proposed configuration; however, we can provide additional dispensing units in some locations as required."

The requirements of § 25.807(c)(1) for a minimum of a Type IV exit on each side of the fuselage is addressed by the installation of a Type I oversized exit with a slide/raft installed on each side of the fuselage. It is believed that since two oversized Type I exits, each with slide/raft installed, as well as the right- and left-side cockpit windows, are available for evacuation, a level of safety greater than that required by § 25.807(c)(1) is provided.

"The requirements of § 25.785(d) to have handgrips installed when seatbacks do not allow a firm handhold could not be met due to the forward cabin zone configuration. For the proposed categories of occupants, the recommendation to remain seated with seat belt fastened, as far as practicable, will be made in order to limit moving around to the necessary minimum.

"Actions to be taken by DAC to provide an equivalent level of safety:"

In order to ensure compliance with the conditions provided in support to this exemption, DAC proposes to include in the DC-10 TCDS the following limitations when operating with a Class E cargo compartment:

1. Occupancy is restricted to a maximum of four supernumeraries when operating with the rigid cargo barrier configuration, or

Occupancy is restricted to a maximum of two supernumeraries when operating with the 9g crash net configuration.

"2. Occupants are limited to the categories specified in § 121.583(a)(1) through (7).

"3. The operator must determine that each supernumerary has the demonstrated physical ability to autonomously use the emergency provisions.

"4. Each occupant must be instructed by the operator in accordance with FAA-approved procedures on the autonomous use of the emergency provisions, and orally briefed before each takeoff by an appropriate crew member as to the location and use of emergency exits and emergency equipment.

"Reasons why granting an exemption is in the public interest and will not adversely affect public safety:"

Granting this exemption will be in the public interest, since by carrying supernumeraries aboard their cargo flights, U.S. operators of DC-10 freighter airplanes will be able to operate under optimal safety conditions, render their operation more efficient, and make substantial savings in carrying their personnel from one destination to another. The reasons for these benefits are developed in arguments above. This will also improve the utility of cargo airplanes.

A summary of DAC's petition was published in the Federal Register on May 14, 1997 (62 FR 26610). No comments were received.

The FAA's analysis/summary is as follows:

14 CFR part 121, e.g., § 121.583, recognizes a "person" category of occupant, as distinct from "passenger" or "crew" occupants addressed in 14 CFR part 25, and allows non-compliance, for operational purposes only, with certain part 121 requirements normally pertinent to passenger-carrying airplanes, passenger-carrying operations, and passenger requirements. These "persons" are commonly referred to as supernumeraries. Supernumeraries are a special class of occupant, by virtue of certain knowledge and abilities attributed to them through selection and mandatory training. The resulting enhanced capabilities of supernumeraries, over that which can be expected of passengers, allows exemption in certain instances from selected type design requirements that are normally imposed for the safety of ordinary passengers. In all cases, however, the desired end result is the retention of all passenger safety features to the maximum extent reasonable, when all factors are considered, and an overall level of safety for supernumeraries that is comparable to that afforded to passengers.

14 CFR part 25 does not address "persons." Therefore, regardless of any part 121 provisions affecting operations, in order to modify part 25 transport category airplanes by installing supernumerary accommodations that do not comply with part 25 certification requirements for passengers, it is first necessary to petition for and obtain exemption from the affected part 25 requirements. To date, the FAA has processed, generally favorably, a number of petitions for exemption associated with the installation of supernumerary accommodations, provided there was a public interest in doing so, and certain conditions were met to assure an adequate level of safety. Those conditions have varied, depending on the airplane design, the nature of the proposals under consideration, and the number of persons involved. In most instances, these petitions have addressed accommodations for only a few supernumeraries, located immediately aft of the flight deck, which is a scenario reasonably consistent with that thought to be envisioned during the promulgation of § 121.583.

This petitioner has proposed two configurations, one seating two supernumeraries and another seating four, in the area immediately aft of the cockpit and forward of the smoke barrier and

crash net or rigid barrier. These are configurations that have some considerable precedent, with features that appear to be generally consistent with a number of previous approvals.

In reviewing the petition, the FAA notes the petitioner's statement that, "all design criteria applicable to the carriage of passengers *have been taken into account"* (emphasis added). The FAA considers this statement to be somewhat less definitive than one declaring compliance with all pertinent sections of the FAR pertaining to the carriage of passengers. Accordingly, this partial grant of exemption shall be understood to address only the specific sections from which exemption is sought, and necessarily assumes that all other pertinent passenger safety requirements of part 25 have been complied with to the satisfaction of the FAA's cognizant Aircraft Certification Office (ACO).

The requirement of § 25.785(d) for handholds is to assure that occupants have a means to steady themselves in moderately rough air while traversing the main aisles of typical passenger airplanes. On the proposed airplane, the occupied area is very small, with no aisles and nowhere to go, and it is possible to return to each seat very quickly. Therefore, the FAA concurs with the petitioner that it is not necessary to provide dedicated handholds beyond those that may be already incidentally available. Accordingly, the petition in this regard is granted.

The pertinent requirements of § 25.807(c)(1) are to assure a certain number of minimally sized emergency exits on each side of the fuselage for the intended occupancy. For the occupancy proposed by the petitioner, a minimum of a Type IV exit on each side is required. The petitioner is actually providing oversized Type I exits, however, which far exceed those minimum requirements. A petition for exemption from those requirements is therefore unnecessary. The FAA notes as commendable the petitioner's retention of existing escape slide/rafts as the required assist means at those exits, and considers their retention as an integral part of the petitioner's proposal.

The requirements of § 25.857(e) permit the carriage of only cargo when a Class E cargo compartment is installed on an airplane. Class E cargo compartments are separate from the flight deck, and generally encompass the entire remaining interior of the airplane. One major concern in permitting occupancy by non-crewmembers outside the flight deck on such airplanes is in assuring that there is a suitable means for preventing smoke penetration into this occupied area. Another concern is that the persons allowed on board the airplane are limited to those that are briefed on emergency equipment and procedures, and are found by the operator to be both physically fit and willing to use the emergency equipment and means of emergency egress provided. The petitioner appears to satisfy these concerns by providing a smoke curtain and by proposing appropriate limitations on the occupants. These proposals are moot, however, because part 121 already addresses these areas.

The design requirements for aircraft with a Class E cargo compartment installed is predicated upon implementation of the cabin decompression procedures required by § 25.857(e)(3) to control a fire until a landing can be effected. Accordingly, DC-10 Airplane Flight Manual

(AFM) procedures which require raising the cabin altitude to 25,000 feet when above 27,000 feet, and establishing a cabin differential pressure of 0.5 psi when below 27,000 feet, remain applicable, and shall be a condition of this exemption. Additionally in that regard, as a condition of this exemption, substantiation shall be provided to the satisfaction of the FAA that sufficient supplemental oxygen is available for all intended occupants at those cabin altitudes, for the maximum anticipated flight durations under those conditions.

Exemption is conditionally granted from the requirement of § 25.857(e) which would otherwise preclude the accommodation of occupants in an airplane in which a Class E cargo compartment is installed, for a maximum of four supernumerary occupants in the accommodations proposed, in an area immediately aft of the cockpit and forward of the crash and smoke barriers as proposed. These conditions are discussed herein.

Although the petitioner has not requested exemption from the requirements of § 25.1445(a), nor is one granted herein, it is noted that the petitioner describes a distribution system for supplemental oxygen which may violate the intent of those requirements, which is to ensure that an adequate supply of oxygen is prioritized for flight crewmembers. Given that a common supply is proposed to be provided for all occupants, with no means proposed to separate the supply between the flight crewmembers and the supernumerary occupants, the petitioner shall, as a condition of this exemption, substantiate to the satisfaction of the FAA that compliance with these requirements has been shown.

Exemption from the requirements of § 25.1447(c)(1) for the automatic presentation of masks is conditioned upon the FAA's determination that the proposed audible and visual means of notifying supernumerary occupants are adequate under all ambient noise and lighting conditions likely to be encountered. The FAA notes that the petitioner variously describes including an "either/or" capability for automatically, via an aneroid switch, or manually notifying of the need to don oxygen masks. The FAA wishes to clarify that a grant of exemption is made from the requirement of § 25.1447(c)(1) with regard to the automatic presentation of *masks*, but only on the condition that automatic *notification* shall be provided, with a manual backup. Exemption is also granted from the requirements of § 25.1447(c)(1) with regard to the uniform distribution of excess masks.

In providing rationales to justify the accommodation of supernumeraries, the petitioner has advanced some arguments which suggest that there is an expectation that these supernumeraries would and could have access to the Class E cargo compartment during taxi, takeoff, flight, and/or landing. Given that there are no regulatory requirements which address this scenario, however, and since the petitioner has not proposed any means of addressing the safety of occupants in this compartment during flight operations, entry into the Class E compartment during taxi, takeoff, flight, and landing shall necessarily be prohibited. Accordingly, it shall be a condition of this grant that any entry point from the supernumeraries' accommodation area to the Class E cargo compartment be placarded to this effect.

Relative to the requirements of § 11.25(b)(5) that a petitioner advance arguments why granting the petition would be in the public interest, the FAA generally expects to be presented with statements as to how the public would benefit from the grant of exemption. This petitioner, however, cited the various advantages of being permitted to accommodate supernumeraries in terms of financial benefit to the operator. In short, it appears that the petitioner's focus is on profitability, and not on reduced cost for the public. Nevertheless, the FAA expects that any increased profitability will, due to market and competitive pressures, result in lower costs and other advantages to the consumer–which is in the public interest.

Finally, attention is drawn to the petitioner's statements that hazardous cargo cannot be left unattended, as one justification for permitting supernumeraries onboard such flights. Without making any determinations as to the accuracy of this claim, the FAA advises in this regard that the carriage of hazardous cargo is governed by the operational and security requirements of 49 CFR part 175. Accordingly, and in view of the fact that the proposed supernumeraries are not being accommodated in the same compartment as any hazardous cargo, the FAA's Transport Airplane Directorate (TAD) makes no determination with regard to the acceptability of carrying supernumeraries on flights with hazardous cargo also onboard. The TAD does, however, as a reasonable precaution, recommend that the potential for exposure to hazardous materials be minimized to the maximum extent practicable, by reducing supernumerary occupancies on such flights to the minimum number absolutely required for safety of flight.

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest and will not significantly affect the level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 USC 40113 and 44701, formerly §§ 313(a) and 601(c) of the Federal Aviation Act of 1958, as amended, delegated to me by the Administrator (14 CFR 11.53), Douglas Aircraft Company, McDonnell Douglas Corporation, is hereby granted an exemption from the requirements of §§ 25.785(d), 25.857(e), and 25.1447(c)(1). The petition is granted to the extent required to permit type certification of the DC-10 freighter aircraft with a Class E cargo compartment, with accommodation for up to four supernumeraries immediately aft of the cockpit, in the two configurations proposed, when the airplane is equipped with two floor-level emergency exits with escape slide/rafts within the immediate vicinity of the occupied area, except as defined in the several conditions discussed above in the FAA's analysis/summary section.

Issued in Renton, Washington, on April 21, 1998

/s/ Gary L. Killion
Gary L. Killion
Acting Manager, Transport Airplane Directorate,
Aircraft Certification Service. ANM-100